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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yoshiyuki Shirakawa

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EXAMINER

GREEN, YARA B

ART UNIT

PAPER NUMBER

2884

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/584,838	Applicant(s) SHIRAKAWA, YOSHIYUKI	
	Examiner YARA B. GREEN	Art Unit 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/31/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: element 200 Figure 15(B). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claim 2 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

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Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 provides for the use of the direction finding radiation detector but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

7. Claim 8 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. **Claims 1-4 and 8-9** are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Brown (US Patent No. 3,581,090; published May 25, 1971).

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Re **claims 1, 8, and 9**, Brown discloses a direction finding radiation detector for detecting a direction of incidence of radioactive rays, the detector comprising:

a plurality of scintillators **23,24,25** made of the same material, being arranged to overlap circumferentially at least in part so that they are shadowed by each other from radioactive rays incident in circumferential directions and so that light emitted from one of the scintillators is not incident on the other scintillators (col. 4, lines 42-48; col. 1, lines 36-44); and photoreceptor devices **27** each having a light receiving surface optically coupled to each of the scintillators (col. 4, lines 57-64), wherein

a combination of proportions of radioactive rays incident directly on the respective scintillators and radioactive rays incident indirectly, being shadowed by the other scintillators, varies with the direction of incidence circumferentially (col. 5, lines 68-73; col. 1, lines 35-44).

Re **claim 2**, Brown teaches the detection finding radiation detector according to claim 1, wherein the scintillators are two in number so that the direction of incidence is detected halfway around the range of 0-180 degrees (col. 9, lines 36-46), where one may consider two one-quarter scintillator crystal.

Re **claim 3**, Brown teaches the direction finding radiation detector according to claim 1, wherein the scintillators are three or more in number so that the direction of incidence is detected all around the range of 0-360 degrees (col. 4, lines 45-49).

Re **claim 4**, Brown teaches the direction finding radiation detector according to claim 1, wherein the scintillators are formed by splitting a single scintillator in the circumferential direction (col. 4, lines 41-46).

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10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 5 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown (US Patent No. 3,581,090; published May 25, 1971) as applied to claim 1, and further in view of Ito et al. (US Patent No. 5,118,948; published January 2, 1992) and Zelakiewicz et al. (US PreGrant Pub. 2006/0065844; filed September 30, 2004).

Brown does teach wherein the scintillators are connected to their respective amplifiers that may have different gains (col. 10, lines 70-75; col. 11, lines 24-28, lines 1-10). Although Brown discloses an analog system, converting and using a digital system is not precluded (col. 16, lines 10-16). In a similar field of endeavour, Ito et al. teach a digital processing circuit for output signals from a plurality of gamma ray detectors. Ito et al. disclose wherein analog to digital converters are operationally connected to their respective photodetector devices (col. 5, line 59 - col. 6, lines 10) which, in turn, are connected to a pulse height analyzer (col. 4, lines 45-50).

Ito et al. teach employing A/D converters for each signal line of the detector instead of single A/D converter. However, in a similar field of endeavour, Zelakiewicz et al. teach using a single A/D converter for converting the signals of photodetector array can be configured to process in real-time and therefore would not suffer any delays (para. 0017). One of ordinary skill in the art would have been motivated to use a single A/D converter, as taught by Zelakiewicz et al. in the apparatus Brown. as modified Ito et al., that would still preserve the sampling frequency of the detector.

Ito et al. further teach using a multichannel pulse height analyzer (col. 4, lines 45-51). One of ordinary skill in the art would have been motivated to implement the pulse height analyzer of Ito et al. in the detector of Brown in order to process digital signals and ascertain the energies of the incident radiation.

Re **claim 7**, Brown does teach wherein the scintillators are connected to their respective amplifiers (col. 10, lines 70-75; col. 11, lines 24-28, lines 1-10). Although Brown discloses an analog system, converting and using a digital system is not precluded (col. 16, lines 10-16). In a similar field of endeavour, Ito et al. teach a digital processing circuit for output signals from a plurality of gamma ray detectors. Ito et al. disclose wherein analog to digital converters are operationally connected to their respective photodetector devices (col. 5, line 59 - col. 6, lines 10) which, in turn, are connected to a pulse height analyzer (col. 4, lines 45-50).

Ito et al. teach using a multichannel pulse height analyzer; however the mere duplication of the pulse height analyzers has no patentable significance unless a new and unexpected result is produced. (*In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960)).

12. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Brown (US Patent No. 3,581,090; published May 25, 1971) as applied to claim 1, and further in view of Ito et al. (US Patent No. 5,118,948; published January 2, 1992) and Deliwala (US Patent No. 7,339,170; filed July 16, 2003).

Brown does teach wherein the scintillators are connected to their respective amplifiers that may have different gains (col. 10, lines 70-75; col. 11, lines 24-28, lines 1-10). Although Brown discloses an analog system, converting and using a digital system is not precluded (col. 16, lines 10-16). In a similar field of endeavour, Ito et al. teach a digital processing circuit for output signals from

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a plurality of gamma ray detectors. Ito et al. disclose wherein analog to digital converters are operationally connected to their respective photodetector devices (col. 5, line 59 - col. 6, lines 10) which, in turn, are connected to pulse height analyzers (col. 4, lines 45-50).

Ito et al. do not teach wherein the A/D converters have different conversion rates. In a similar field of endeavour of image processing, Deliwala teach implementing A/D converters with different sampling frequencies in order to provide for the dynamic range of the incident radiation (col. 15, lines 11-51). One of ordinary skill in the art would have been motivated to use A/D converters with different sampling frequencies, as taught by Deliwala, in the apparatus of Brown, as modified by Ito et al., in order to provide a large dynamic range for detection.

Ito et al. further teach using a multichannel pulse height analyzer (col. 4, lines 45-51). One of ordinary skill in the art would have been motivated to implement the pulse height analyzer of Ito et al. in the detector of Brown in order to process digital signals and ascertain the energies of the incident radiation.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Muehllehner (US Patent No. 3,937,964) teach a directional gamma detector with a hexagonal photodetector layout. Yamashita et al. (US Patent No. 5,862,061) teach a position sensitive gamma ray detector comprising of photomultiplier tubes as photodetectors in communication with respective amplifiers and A/D converters.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YARA B. GREEN whose telephone number is (571)270-3035. The examiner can normally be reached on Monday - Thursday, 8am - 5pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/Constantine Hannaher/
Primary Examiner, Art Unit 2884**

Yara B. Green
/YBG/